CLAIMS

What is claimed is:

1.   A composition for the modulated release of a biologically active pharmaceutical agent, comprising:

        a)   a biocompatible and biodegradable polymeric matrix;

        b)   an effective amount of a biologically active pharmaceutical agent, the biologically active pharmaceutical agent being dispersed within the polymeric matrix; and

        c)   a metal cation component for modulating the release of the biologically active agent from the polymeric matrix, wherein said metal cation component is selected from the group consisting of magnesium hydroxide, magnesium carbonate, calcium carbonate, zinc carbonate, magnesium acetate, zinc acetate, magnesium chloride, zinc chloride, magnesium sulfate, zinc sulfate, magnesium citrate and zinc citrate, and wherein the metal cation component is separately dispersed within the polymeric matrix.

2.   A modulated release composition of Claim 1 wherein said biodegradable and biocompatible polymer is selected from the group consisting of poly(lactide)s, poly(glycolide)s, poly(lactide-co-glycolide)s, polyanhydrides, polyorthoesters, polyetheresters, polycaprolactone, polyesteramides, blends and copolymers thereof.

3.   A modulated release composition of Claim 2 wherein said biologically active agent comprises a protein.

4.   A modulated release composition of Claim 3 wherein said protein is selected from the group consisting of nucleases, erythropoietin, human growth hormone, interferons, interleukins, growth factors, tumor necrosis factor, adrenocorticotropic hormone, and colony-stimulating factors.

5   5.   A composition for the modulated release of a biologically active agent, comprising:

a)   a biocompatible polymeric matrix of a polymer selected from the group consisting of poly(lactide)s, poly(glycolide)s, poly(lactide-co-glycolide)s and blends
10   thereof;

b)   an effective amount of a biologically active protein, said biologically active protein being dispersed within the polymeric matrix; and

c)   a metal cation component for modulating release of the
15   biologically active agent from the polymeric matrix, wherein said metal cation component is selected from the group consisting of magnesium hydroxide, magnesium carbonate, calcium carbonate, zinc carbonate, magnesium acetate, zinc acetate, magnesium sulfate, zinc sulfate,
20   magnesium chloride, zinc chloride, zinc citrate and magnesium citrate, and wherein the metal cation component is separately dispersed within the polymeric matrix.

6.   A modulated release composition of Claim 5 wherein said biologically active
25   protein is selected from the group consisting of nucleases, erythropoietin, human growth hormone, interferons, interleukins, growth factors, adrenocorticotropic hormone, tumor necrosis factor and colony-stimulating factors.

7.   A method for modulating the release of a biologically active agent from a
polymeric matrix, comprising:

a)   dissolving a biocompatible polymer in a solvent to form a
polymer solution;

5   b)   dispersing a metal cation component in said solvent,
wherein the metal cation component comprises a metal
cation selected from the group consisting of Zn(II), Mg(II)
and a combination of at least two different multivalent
metal cations;

10   c)   separately dispersing a biologically active agent in said
polymer solution; and

d)   solidifying said polymer from said polymer solution to
form a polymeric matrix, whereby the metal cation
component modulates the release of the biologically active

15   agent from the polymeric matrix.

8.   A method of Claim 7 wherein said biologically active agent comprises a protein.

9.   A method of Claim 8 wherein said protein is selected from the group consisting
of nucleases, erythropoietin, human growth hormone, interferons, interleukins,
growth factors, adrenocorticotropic hormone, tumor necrosis factor and colony-
20   stimulating factors.

10.   A method of Claim 9 wherein said polymer is biodegradable.

11.   A method of Claim 10 wherein said biodegradable polymer is selected from the
group consisting of poly(lactide)s, poly(glycolide)s, poly(lactide-co-glycolide)s,

polyanhydrides, polyorthoesters, polyetheresters, polycaprolactone, polyesteramides, blends and copolymers thereof.

12. A method of Claim 7, further comprising the step of dissolving said metal cation component in a second solvent before dispersing the metal cation component in

5 the polymer solution, wherein the second solvent is miscible with the first solvent, and wherein said polymer is soluble in the second solvent.

13. A method of delivering a biologically active agent to an individual in need thereof comprising the step of administering to said patient a composition for the modulated release of a biologically active agent comprising:

10   a) a biocompatible polymeric matrix;

        b) an effective amount of a biologically active agent, wherein the biologically active agent is dispersed within the polymeric matrix; and

        c) one or more metal cation components for modulating

15   release of the biologically active agent from the polymeric matrix wherein the metal cation component comprises a cation selected from the group consisting of Zn(II), Mg(II) and a combination of at least two different multivalent metal cations, and wherein the metal cation component is

20   separately dispersed within the polymeric matrix.

14. The method of Claim 13 wherein said metal cation component is selected from the group consisting of magnesium hydroxide, magnesium carbonate, zinc carbonate, magnesium acetate, zinc acetate, magnesium chloride, zinc chloride, magnesium sulfate, zinc sulfate, magnesium citrate and zinc citrate.

25 15. The method of Claim 13 wherein said polymer is a biodegradable polymer.

16. The method of Claim 15 wherein said biodegradable polymer is selected from the group consisting of poly(lactide)s, poly(glycolide)s, poly(lactide-co-glycolide)s, poly(lactic acid)s, poly(glycolic acid)s, poly(lactic acid-co-glycolic acid)s, polyanhydrides, polyorthoesters, polyetheresters, polycaprolactone, polyesteramides, blends and copolymers thereof.

17. The method of Claim 13 wherein said biologically active agent is a protein selected from the group consisting of nucleases, erythropoietin, human growth hormone, interferons, interleukins, growth factors, tumor necrosis factor, adrenocorticotropic hormone, and colony-stimulating factors.